

**The Claims Defining the Invention are as follows:**

1. A system for detecting the sliding of a wheel travelling along a track comprising:

a roller rotatable about a rotation axis, said roller disposed adjacent said track so that a wheel travelling along said track engages said roller and causes the roller to rotate about said rotation axis;

a rotation sensor associated with said roller for providing a rotation signal representative of the degree of rotation of said roller; and

a processor for calculating the degree of rotation of said roller from said rotation signal and comparing said degree of rotation with a pre-determined range of degrees of roller rotations and providing a signal indicative of sliding of said wheel when said degree of rotation of said roller is outside said pre-determined range.

2. The system according to claim 1, comprising a suspension system for supporting said roller.

3. The system according to claim 2, wherein said suspension system includes a bias device for biasing said roller into contact with said wheel.

4. The system according to claim 3, wherein said suspension system further comprises:

a housing which rotatably supports said roller; and, a frame to which said housing is pivotally coupled to enable said housing to pivot about a pivot axis substantially perpendicular to said rotation axis.

5. The system according to claim 4, wherein said bias device acts between said housing and said frame.

6. The system according to claim 1, further comprising a wheel detection mechanism for providing a wheel detect signal when a wheel is in contact with said roller.
7. The system according to claim 6, wherein said wheel detection mechanism comprises a sensor for sensing motion of said housing about said pivot axis.
8. The system according to claim 6, wherein said processor calculates said degree of rotation while said wheel detect signal is present.
9. The system according to claim 1, further comprising a brake mechanism for preventing free rotation of said roller when not in contact with said wheel.
10. The system according to claim 1, further comprising a wheel direction sensor for sensing the direction in which the said wheel is passing over said roller.
11. The system according to claim 10, wherein said wheel direction sensor includes strain transducers on opposite sides of said rotation axis.
12. The system according to claim 11, wherein said strain transducers are mounted on opposite sides of said housing.
13. The system according to claim 6, wherein said processor is programmed with a counter to count the number of axles on which wheels passing said roller are mounted, where the counter is incremented by one when said wheel detection mechanism provides a wheel detect signal and said wheel direction

sensor indicates said wheel passing in a first direction, and said count is decremented by one when said wheel detection mechanism provides a wheel detect signal and said wheel detection sensor indicates said wheel is passing second direction opposite to said first direction.

14. The system according to claim 1, wherein said processor is programmed with an algorithm for estimating tread wear of said wheel on a basis of said rotation signal.

15. A system for detecting the slipping or sliding of a wheel travelling along a track comprising:

a roller and rotatable about a rotation axis disposed adjacent said track so that a wheel travelling along said track engages said roller;

a rotation sensor associated with said roller for providing a rotation signal representative of the degree of rotation of said roller; and

a processor for calculating the degree of rotation from said rotation signal and comparing said degree of rotation with a pre-determined range of roller rotations and providing a signal indicative of said wheel sliding when said degree of rotation is less than said pre-determined range, and providing a signal indicative of said wheel slipping when said degree of rotation is greater than said pre-determined range.